

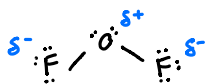
\*\*\* When a molecule is polar, you can find the  $\delta^-$  and  $\delta^+$  on its Lewis structure.  
Note: the  $\delta^+$  and  $\delta^-$  are NOT required when asked to draw a molecule's Lewis structure.

## Lesson 9 – Polarity and ~~Inter~~<sup>Intra</sup>molecular Forces Worksheet

1. For each of the following molecules, draw the Lewis structure, find the shape, and identify the polarity.

a)  $\text{OF}_2$

① Lewis structure:



② Shape:

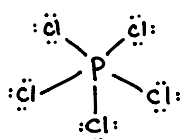
$\text{AX}_2\text{E}_2 \Rightarrow$  bent shape

③ Polarity:

asymmetrical  $\Rightarrow$  polar  
charge distribution

b)  $\text{PCl}_5$

① Lewis structure:



② Shape:

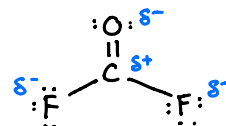
$\text{AX}_5 \Rightarrow$  trigonal bipyramidal

③ Polarity:

symmetrical  $\Rightarrow$  non-polar  
charge distribution

c)  $\text{COF}_2$

① Lewis structure



② Shape:

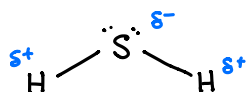
$\text{AX}_3 \Rightarrow$  trigonal planar

③ Polarity:

symmetrical  $\Rightarrow$  Polar  
charge distribution

c)  $\text{H}_2\text{S}$

① Lewis structure



② Shape:

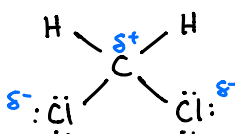
$\text{AX}_2\text{E}_2 \Rightarrow$  bent

③ Polarity

asymmetrical  $\Rightarrow$  polar  
charge distribution

d)  $\text{CH}_2\text{Cl}_2$

① Lewis structure



② Shape:

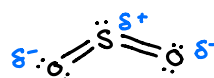
$\text{AX}_4 \Rightarrow$  tetrahedral

③ Polarity:

asymmetrical  $\Rightarrow$  polar  
charge distribution

e)  $\text{SO}_2$

① Lewis structure



② Shape:

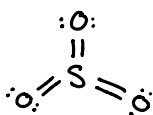
$\text{AX}_2\text{E}_1 \Rightarrow$  bent

③ Polarity:

asymmetrical  $\Rightarrow$  polar  
charge distribution

f)  $\text{SO}_3$

① Lewis structure:



② Shape:

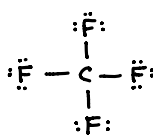
$\text{AX}_3 \Rightarrow$  trigonal planar

③ Polarity

symmetrical  $\Rightarrow$  non-polar  
charge distribution

g)  $\text{CF}_4$

① Lewis structure



② Shape:

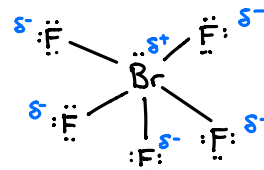
$\text{AX}_4 \Rightarrow$  tetrahedral

③ Polarity

symmetrical  $\Rightarrow$  non-polar  
charge distribution

h)  $\text{BrF}_5$

① Lewis structure



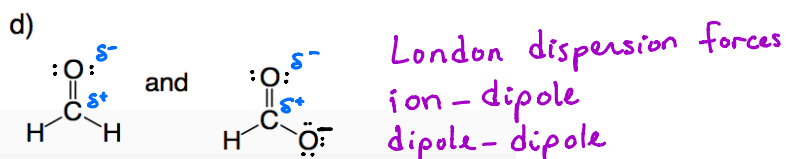
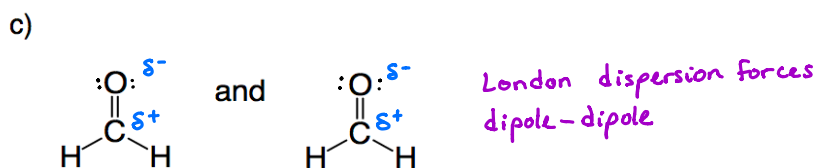
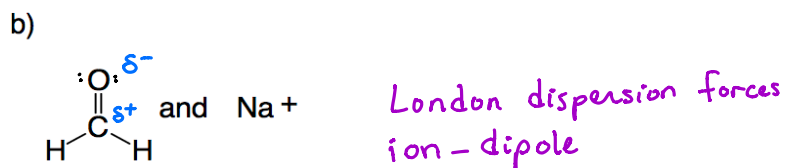
② Shape

$\text{AX}_5\text{E}_1 \Rightarrow$  square pyramidal

③ Polarity

asymmetrical  $\Rightarrow$  polar  
charge distribution

2. List all types of intramolecular forces that would be exhibited between the pairs of species shown below



3. Which of the following pairs of compounds can form hydrogen bonds? For those that can, identify the partial positive and partial negative charges in the molecules and indicate where the hydrogen bond will form. For those that cannot form hydrogen bonds, identify the intramolecular forces present between the pair.

